M. TECH.-II (CIVIL-HYDRAULIC ENGINEERING) (CBCS – 2015 COURSE) : SUMMER - 2018

SUBJECT : HYDRAULIC STRUCTURES

Day : **Wednesday** | **S-2018-2995** | Time : **11.00 AM TO 02.00 PM**

Date : **13/06/2018** | Max. Marks : 60

N. B. :

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Answers to both sections should be written in the **SEPARATE** answer books.
4) Use of non-programmable calculator is **ALLOWED**.
5) Assume suitable data, if necessary.

SECTION - I

Q. 1 List the various forces on the dam and explain the significance of seisumic forces for the stability of dam **(10)**

OR

a) Derive expression for limiting height of low gravity dam and differentiate between low and high dam. **(05)**

b) Explain the term "load combination" and significance for the design of gravity dam. **(05)**

Q. 2 What is pore pressure? How it is estimated? What is significance of drawing phreatic line for the estimation of leakage through body of earthen dam? **(10)**

OR

a) Explain the requirement of material for roller compacted dam and state design criteria and advantages. **(05)**

b) What is advantage of colgrout masonry in the gravity dam? Explain the peculiar construction technique. **(05)**

Q. 3 What is piping phenomena in the earthen dam? What are the measures to reduce leakages through the foundation for the earthen dam? **(10)**

OR

What are the adverse effects on the stability analysis due to sudden draw down and steady state on up-stream and down-stream slopes of the earthen dam? **(10)**

(10)

P. T. O.

SECTION - II

Q. 4 **a)** Describe the protective measures for up-stream and down-stream slops of earthen dam. **(05)**

b) What is significance of filters in the seepage control through the earthen dam? **(05)**

OR

What is the hydraulics related to energy dissipation in the design of roller bucket and ski jump bucket on the erosion on down-stream side? **(10)**

Q. 5 **a)** What is chute spillway? State its criteria for hydraulic design. **(05)**

b) Discuss the factors affecting coefficient of discharge over the ogee shaped spillway. **(05)**

OR

a) Write notes on : **i)** Drum gates used over spillway **(05)**

ii) Design of weirs and barrages

b) Elaborate hydraulic design aspects of measures for optimization of length of hydraulic jump type energy dissipaters. **(05)**

Q. 6 Write notes on : **i)** Effect of tail water curve on downstream erosion. **(10)**

ii) Ski jump type of energy dissipater

OR

What are parameters for monitoring the performance of gravity dam? Discuss in brief any two. **(10)**

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